CLINICAL TOXICOLOGY LAB.

5TH STAGE / 1ST SEMESTER

(2021 – 2022)

PRINCIPLES IN MANAGEMENT OF TOXICITY CASES (PART 1)

Assis. Lecturer

Zeena A. Hussein

Nibras J. Tahseen

Strategies for Management of Poisoned Patients:

- The treatment of the poisoned patients in the emergency department include the following:
  - *Assess ABC and stabilize the patient*
  - *Clinical evaluation:*
    a. Patient history
    b. Physical examination
    c. Laboratory investigation
    d. Radiology analysis
  - *Prevention of further absorption*
  - *Enhancement of elimination*
  - *Administration of antidote*
  - *Supportive care and follow up*

Supportive Care	
Airway protection	Treatment of seizures
Oxygenation/ventilation	Correction of temperature abnormalities
Treatment of arrhythmias	Correction of metabolic derangements
Hemodynamic support	Prevention of secondary complications
Prevention of Further Poison Absorption	
Gastrointestinal decontamination	Decontamination of other sites
Gastric lavage	Eye decontamination
Activated charcoal	Skin decontamination
Whole-bowel irrigation	Body cavity evacuation
Dilution	
Endoscopic/surgical removal	
Enhancement of Poison Elimination	
Multiple-dose activated charcoal administration	Extracorporeal removal
Alteration of urinary pH	Hemodialysis
Chelation	Hemoperfusion
	Hemofiltration
	Plasmapheresis
	Exchange transfusion
	Hyperbaric oxygenation
Administration of Antidotes	
Neutralization by antibodies	Metabolic antagonism
Neutralization by chemical binding	Physiologic antagonism
Prevention of Reexposure	
Adult education	Notification of regulatory agencies
Child-proofing	Psychiatric referral

1/ Assess ABC & Stabilization:

A
- **Airway**
- Signs of obstruction (dysphonia, cyanosis, apnea)

B
- **Breathing**
- Chest movement, respiratory rate.

C
- **Circulation**
- Skin color, temperature, pulse (rate & rhythm)

D
- **Disability**
- Assess level of consciousness

Support breathing

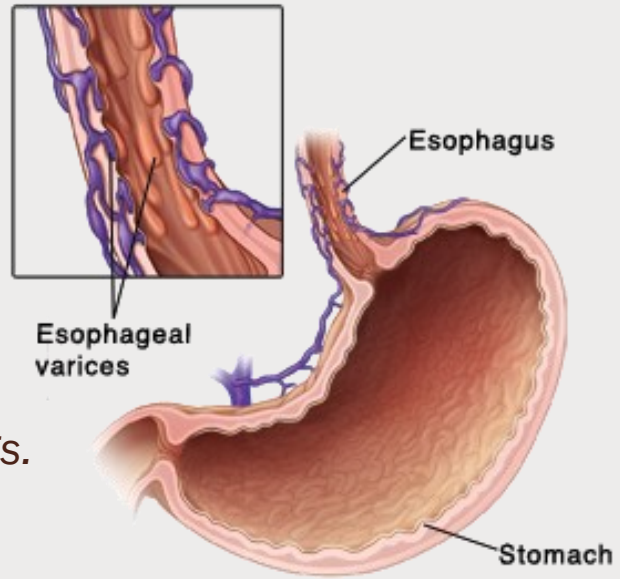
Administration of oxygen

Cardiovascular stabilize B.P and normalize H.R

CNS consciousness control convulsions

2/ Prevention of Further Absorption:

- It is done through gastric emptying by:
  - *Emesis*
  - *Gastric lavage*
  - *Dilution*
  - *Activated charcoal*
  - *Whole bowel irrigation*
- **Indications:**
  - *Recent ingestions, less than 1-2 hr., especially for slow release drugs.*
  - *Ineffective or nonexistent antidotes e.g. colchicine.*
  - *EC or SR tablets e.g.: aspirin , verapamil, theophylline.*
- **Contraindications:**
  - *Caustic acid / alkali ingestion*
  - *Hydrocarbon ingestion*
  - *High bleeding tendencies or coagulopathies*
  - *Esophageal varices*
  - *Significant vomiting*



Prevention of Absorption:

- Emesis
- Gastric Lavage
- Dilution
- Activated Charcoal
- Whole Bowel Irrigation

A. Syrup of Ipecac:
   - *Indications:*
     - Ingestion at home
     - Ingestion by infants older than 6 months
   - *Mechanism of Action (MOA):*
     - Early induction/ within 30 min. by direct stimulation and irritation of gastric mucosa
     - Late induction/ after 30 min by stimulation of CRTZ
   - *Complications:*
     - Aspiration pneumonitis
     - Delay administration of AC
     - Electrolyte disturbance
     - Arrythmias with chronic use
     - Convulsions or skeletal muscle weakness

Prevention of Absorption:

- *Contraindications:*
  - Compromised airway protective reflexes
  - Seizures and loss of consciousness
  - Caustic acid / alkali ingestion
  - Significant vomiting or hematemesis
  - Effect diminished by AC

- *Dosage of Ipecac syrup:*
  - Adults & children over 6 years = 30ml
  - Children 1 – 5 years = 15 ml
  - Infants 6 – 12 months = 10 ml

- Ipecac has been used by individuals with bulimia nervosa as a means to achieve weight loss through induced defensive vomiting.

Prevention of Absorption:

A. Apomorphine:

- *Is a morphine derivative*
- *Produce quick emesis within 3 – 5 min. by direct stimulation of CRTZ*
- ***Mechanism of Action:***
  - Direct agonist of D1 & D2 receptors
  - Antagonist of 5-HT2 receptors
  - Antagonist of alfa-adrenoceptors
- ***Uses:***
  - Induce emesis in animals
  - Anti-Parkinson
  - Alcoholism
  - Managing certain cases of opioid addiction
- *Given by injection*
- *Suitable to administer with AC*
- *It may produce prolonged CNS depression*

Prevention of Absorption:

- Emesis
- Gastric Lavage
- Dilution
- Activated Charcoal
- Whole Bowel Irrigation

- Usefulness depend on time (10-20%) of gastric content removed after one hour of ingestion
- Lavage solution: Lavage fluids administered in 20-30ml aliquots, each followed by removal of the stomach contents.
- After lavage specific antidote administered if available, otherwise, activated charcoal is administered.
- Dose: 10 ml/kg/lavage of 0.9% saline up to 400ml in adult

- **Indications:**
  - *Ingestion of drug or toxin that still in stomach (less than 1hr).*
  - *Ingestion of drug or toxin that delay gastric emptying or EC, SR preparations*
- **Complications:**
  - *Inadvertent tracheal intubation or airway trauma*
  - *Esophageal /gastric perforation or hemorrhage, aspiration pneumonitis.*
- **Contraindications:**
  - *Compromised airway*
  - *Caustic acid or alkali ingestion*
  - *Bleeding diathesis*
  - *significant emesis*

Prevention of Absorption:

- Emesis
- Gastric Lavage
- Dilution
- Activated Charcoal
- Whole Bowel Irrigation

- Water or milk can be used
- **Water as diluent:**
  - *100 – 200 ml for children*
  - *300 – 400 ml for adults*
  - *Accidental ingestion of household products*

  - ***Advantage:***
    - Reduce gastric irritation produced by the poison
    - Increase effectiveness of Ipecac syrup
  - ***Disadvantage:***
    - Excessive fluid causes stomach distension, and then premature emptying of stomach content to the duodenum

Prevention of Absorption:

- *Contraindications:*
  - If the ingested poison is in solid dosage form (why?)
  - Unconscious patients
  - Patients without gag reflex

- **Milk as diluent:**
  - *Useful for ingestion of caustic or irritating substances*
  - *It delays the onset of Ipecac emesis*
  - *Reduce the efficacy if activated charcoal*
  - *Should not be used with phosphorus (why?)*

Prevention of Absorption:

- Emesis
- Gastric Lavage
- Dilution
- Activated Charcoal
- Whole Bowel Irrigation

- **Indication:**
  - *When both emesis and gastric lavage are contraindicated*
  - *After completion of emesis and lavage*
  - *In multiple doses in hemodialysis*
- **Contraindication:**
  - *Intestinal obstruction*
  - *Corrosive agent ingestion*
  - *Some antidotes (e.g. methionine)*
  - *Concomitant use with Ipecac syrup*
- Preferably given with cathartic (why?)
- Dose of 50 – 100g for adults, and 0.5 – 1g/kg for children

Prevention of Absorption:

- Emesis
- Gastric Lavage
- Dilution
- Activated Charcoal
- Whole Bowel Irrigation

- Is performed by administration of large quantities of isotonic polyethylene glycol through a nasogastric tube, until the rectal effluent is clear
- **Indication:**
  - *Enhance the elimination of EC and SR oral dosage forms*
  - *Drugs not adsorbed by AC (e.g. iron, lithium, heavy metal)*
- **Adverse effects or complications:**
  - *Vomiting*
  - *Bloating and abdominal pain*
  - *Reduce efficacy of AC*
- **Contraindications:**
  - *Intestinal obstruction*
  - *GIT perforation or bleeding*
  - *Pre-existing diarrhea*
  - *Persistence vomiting*


Thank You
For Your
Attention